

What is claimed is:

1. A method for manufacturing nanostructure patterns comprising:  
overlaying a multilayer organic molecule resist on at least a portion of a parent structure selectively deposited on a substrate;  
depositing a layer over the parent structure and in contact with at least a portion of the multilayer organic resist; and  
removing the multilayer organic molecule resist to leave a residual structure.
2. The method of claim 1 wherein the step of removing the organic resist is chemical.
3. The method of claim 1 wherein the step of removing the organic resist is electrochemical.
4. The method of claim 1 wherein the step of removing the multilayer organic molecule resist removes a portion of the deposited layer.
5. The method of claim 1 wherein the residual structure includes a line.
6. The method of claim 1 wherein the residual structure includes a dot.
7. The method of claim 1 wherein the residual structure includes a ring.
8. The method of claim 1 wherein the residual structure includes two or more adjacent lines.

9. The method of claim 1 wherein a first portion of the parent structure is a first material and a second portion of the parent structure is a second material.

10. The method of claim 1 further comprising imaging the residual structure with electron microscopy.

11. The method of claim 1 further comprising imaging the residual structure with scanning probe microscopy.

12. The method of claim 1 wherein the substrate is silicon.

13. The method of claim 1 wherein the organic molecule resist is a mercaptoalkanoic acid.

14. The method of claim 1 wherein the layers of the multilayer organic molecule resist are connected with ions.

15. The method of claim 13 wherein each layer of organic molecules is connected with  $\text{Cu}^{2+}$  ions.

16. The method of claim 1 further comprising smoothing the parent structure.

17. The method of claim 16 wherein smoothing is accomplished chemically.

18. The method of claim 16 wherein smoothing is accomplished electrochemically.

19. The method of claim 1 further comprising designing the parent structure to reduce the residual nanostructure size.

20. The method of claim 19 wherein the step of designing includes designing the parent structure to have at least one concave segment.

21. The method of claim 1 further comprising removing a portion of the residual structure.
22. The method of claim 1 further comprising:  
overlaying a second multilayer organic molecule resist on at least a portion of the residual structure;  
depositing a second layer over the residual structure and in contact with at least a portion of the second multilayer organic resist; and  
removing the second multilayer organic molecule resist to leave a second residual structure.
23. The method of claim 22 further comprising smoothing the residual structure.
24. The method of claim 23 wherein smoothing is accomplished chemically.
25. The method of claim 23 wherein smoothing is accomplished electrochemically.
26. The method of claim 22 further comprising designing the residual structure to reduce the second residual structure size.
27. The method of claim 22 wherein the second layer adheres only to the residual structure.
28. The method of claim 22 further comprising removing a portion of the second residual structure.
29. The method of claim 22 further comprising removing a portion of a subsequent generation residual structure.
30. A nanostructure comprising:  
a substrate;

at least one residual structure attached to the substrate and created by overlaying a multilayer organic molecule resist on at least a portion of a parent structure selectively deposited on the substrate, depositing a layer over the substrate and in contact with at least a portion of the multilayer organic resist, and removing the multilayer organic resist.

30. The nanostructure of claim 29 wherein at least a portion of the residual structure has a width of less than approximately 100 nm.

31. The component of claim 29 wherein at least two traces of the residual structure are separated by a spacing of approximately 3 nm to approximately 40 nm.